

A NEW SPECIES OF *COPHIXALUS* (ANURA: MICROHYLIDAE) FROM
NORTHERN QUEENSLAND

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Cophixalus monticola sp. nov. is described from high elevation (> 1100m a.s.l.) rainforest on the Carbine Tableland, northern Queensland. Morphologically, it is similar to *Cophixalus concinnus* with which it occurs in sympatry. It differs from *C. concinnus* and all other Australian congeners in having a mating call that is a short trill lasting about 0.6s. □ *Frog, new species, Microhylidae, Cophixalus monticola, upland rainforest.*

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Microhylid frogs in Australia reach their greatest diversity in the Wet Tropics Biogeographic Region of northern Queensland. Twelve of 16 described species are found only in the narrow strip of tropical rainforest between Cooktown in the north and Mount Elliot near Townsville in the south (McDonald, 1992; Zweifel, 1985). Several species are widespread in this region (e.g. *Cophixalus ornatus*, *Sphenophryne fryi*) but others have restricted distributions, often associated with upland rainforest refugia (McDonald, 1992). Morphologically, Australian microhylids are extremely conservative and mating call has been an important tool in defining a number of species (Zweifel, 1985).

The Carbine Tableland of northern Queensland supports the most diverse assemblage of microhylid frogs in Australia including three *Cophixalus* and two *Sphenophryne* species (Zweifel, 1985). One of these species, *Cophixalus concinnus*, was originally described from Thornton Peak (Tyler, 1979) but had been collected previously from Mt Spurgeon on the Carbine Tableland (Zweifel, 1985). During research with Mr Garry Werren on the Carbine Tableland in the summer of 1985-86, Mr Andrew Dennis and Mr Michael Trenerry recognised a previously unknown species of *Cophixalus* that produced a short trill unlike the mating call of any other Australian *Cophixalus*.

The new species lacks clavicles and procoracoids, and the supplementary slip to its m.intermandibularis is narrow and runs parallel to the mandible. Both of these data indicate that the species belongs to *Cophixalus* and not to

Sphenophryne, the only other microhylid genus found in Australia (Burton, 1984).

Although morphologically similar to *C. concinnus* the call of this species is unlike the slow rattle described for a paratype of *C. concinnus* (Zweifel, 1985). Here we describe and illustrate the new species.

Specimens are lodged in the Queensland Museum (QM). Methods of measurement (in millimetres) follow Zweifel (1985). SVL=snout-vent length; TL=tibia length; EN=eye-naris; IN=internarial distance; HW=head width; ED=eye diameter.

SYSTEMATICS

Cophixalus monticola sp. nov. (Figs 1, 2)

MATERIAL EXAMINED

HOLOTYPE: QMJ58727, adult male, collected by S. Richards & A. Dennis, Carbine Tableland, 16°30'38"S, 145°16'18"E, altitude 1180m, 6.xii.93.

PARATYPES: QMJ58728-9 same data as for holotype; QMJ58730-1, M. Trenerry, G. Werren, 4.i.89; QMJ58732, M. Trenerry, G. Werren, 2.i.89; QMJ58733, QMJ58854, M. Trenerry, G. Werren, 30.i.88; QMJ58855-6, M. Trenerry, G. Werren, 13.i.88; QMJ58857, A. Dennis, M. Trenerry & G. Werren, 2.i.87; QMJ58871-3, A. Dennis, M. Trenerry, G. Werren, 12.xii.86; QMJ58874, A. Dennis, M. Trenerry, G. Werren, 5.i.86. All paratypes collected at altitudes over 1100m along a 4km stretch of Mt Lewis Rd at the type locality.

DIAGNOSIS

Distinguished from all known Australian congeners by a combination of the following charac-



FIG. 1. *Cophixalus monticola*, male, Carbine Tableland, northern Queensland.

ters: moderate size (males 17.3-21.2), tympanum indistinct, hind legs short (TL/SVL 0.37-0.41), mating call a short trill.

DESCRIPTION OF HOLOTYPE

An adult male with the following measurements. SVL 19.5; TL 8.0; EN 1.3; IN 1.6; SN 0.5; HW 7.6; ED 2.3; disc of third finger 0.9 (penultimate phalange 0.5); disc of fourth toe 0.9 (0.6).

Snout bluntly rounded in dorsal view, slightly projecting in profile; canthus rostralis rounded, loreal region steep, nearly vertical; nostrils lateral, much closer to tip of snout than to eye (EN/SN 2.6). Internarial distance greater than eye to naris distance (EN/IN 0.8), tympanum scarcely visible. Relative lengths of fingers 3>4>2>1, first finger very short; disc of first finger small, disc-like but not expanded, grooved terminal discs on second to fourth fingers well developed. Subarticular tubercles low, indistinct, no metacarpal tubercles. Toes unwebbed, relative lengths 4>3>5>2>1, all toes with grooved discs but disc on first toe rather poorly developed. Subarticular tubercles low, indistinct. Skin smooth dorsally and ventrally.

In preservative brown dorsally with scattered pale pink markings concentrated in the mid-line. Two pale lumbar ocelli evident. Dorsal pigmentation more diffuse laterally and on ventral surface of limbs. Central portion of venter white, bordered laterally and separated from lateral pigmentation by two broken, ventrolateral lines of dark pigment. Two indistinct pinkish bars behind eyes. No postocular stripe.

VARIATION

The paratypes are adult males with the following selected measurements and proportions: SVL 17.3-21.2; TL 6.9-8.1; HW 6.9-8.0; EN 1.3-1.55; IN 1.5-1.8; TL/SV 0.37-0.43; EN/IN 0.76-1.0. Colour in life is variable dorsally, ranging from red-brown through tan to yellow-brown, often with darker mottling on the back and legs, and there may be a broad pale vertebral stripe or a dark bar behind the eye. All of the types had two pale lumbar ocelli and ventrally were uniform pale yellow, red-brown, or white, with a darker throat region. Scattered dorsal tubercles are evident in some specimens (Fig. 1).

MATING CALL

The mating call of this species is a short trill. A single mating call of each of 10 different frogs recorded at 18-19.8°C had the following parameters: dominant frequency 2.5-3.0KHz; duration 0.44-0.66s; pulse rate 23.3-41.0 pulses/s. A typical call recorded 6.xii.93 is presented in Fig. 2A (QMJ58729). The pulse rate increases sharply towards the end of this call but some calls did not exhibit this change in pulse rate. For comparison mating calls of two sympatric *Cophixalus*, *C. hosmeri* and *C. concinnus*, recorded at the type locality are presented (Fig. 2B,C). These were recorded on the same night

and at the same air temperature (17.8°C) as that presented for *C. monticola* (Fig. 2A).

Zweifel (1985) has discussed variation in calls of *C. concinnus* and *C. hosmeri* and noted that calls of Carbine Tableland *C. concinnus* closely resemble those described for one of the paratypes of that species collected on Thornton Peak. The calls of *C. hosmeri* and *C. concinnus* are a series of rather sharp 'clicks' or 'taps' differing in pulse rate and call length, and have an acoustic affect quite unlike the trill of *C. monticola*. The call of *C. concinnus*, the only species likely to be confused with *C. monticola*, is a slow tapping call lasting about 1-2 seconds and with a pulse rate of only 8-12/s (Zweifel, 1985). However the sug-

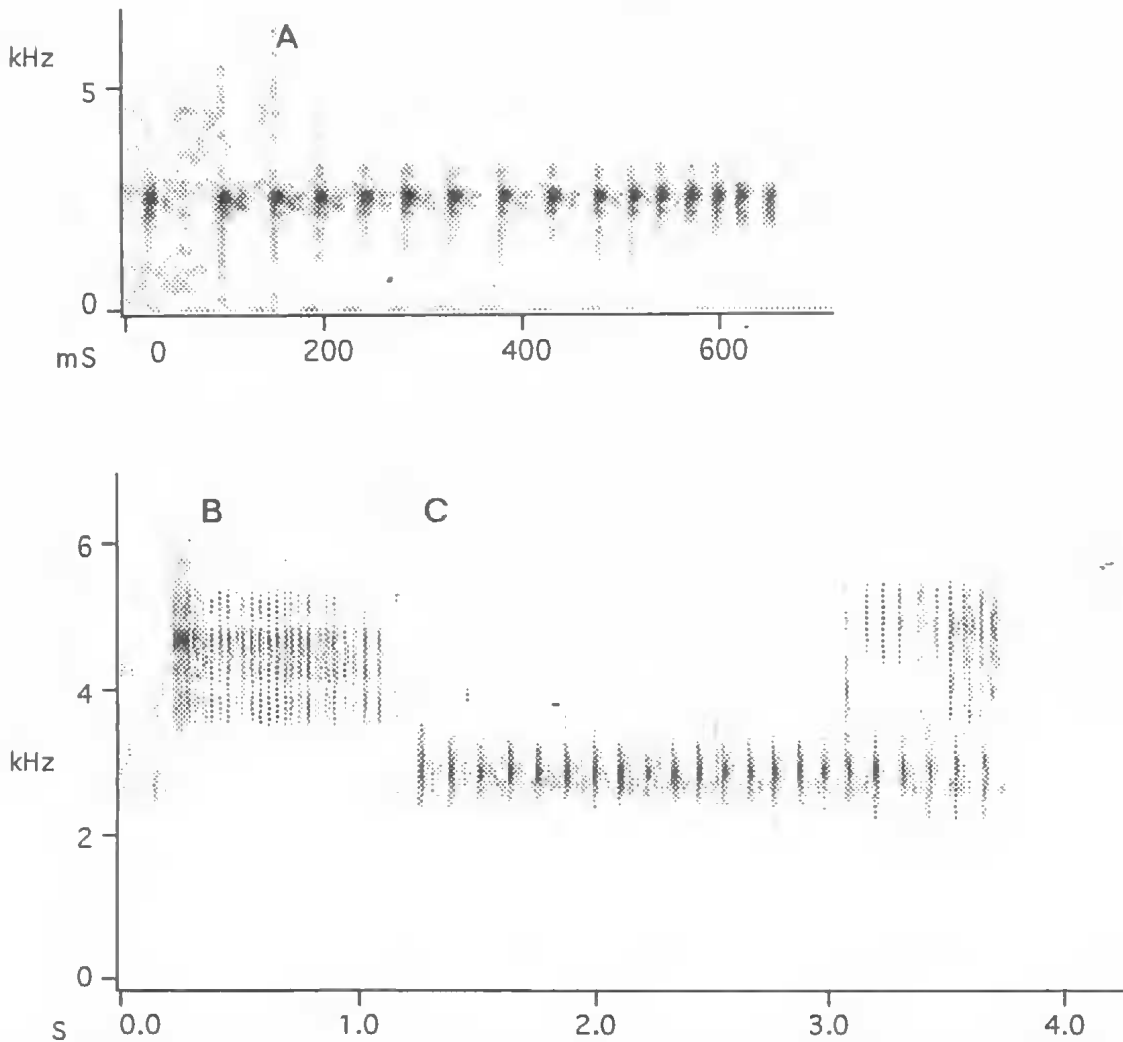


FIG. 2. Mating call. A, *Cophixalus monticola*; B, *Cophixalus hosmeri*; C, *Cophixalus concinnus*. Recorded on the Carbine Tableland, northern Queensland, 6.xii.93. Air temperature = 17.8°C.

gestion of Zweifel (1985) that the pulse rate of *C. hosmeri* is slower than *C. concinnus* at corresponding temperatures is incorrect, the opposite being true (Fig. 2; pers. obs.).

DISTRIBUTION AND HABITAT

Cophixalus monticola is known only from elevations above approximately 1100m on the Carbine Tableland. Males call from elevated perch sites, most commonly on *Linospadix* plants, up to 1.5m above the ground in closed-canopy rainforest. The paratypes were collected from the leaf axils of *Linospadix* palms (5), under the bark or in crevices of fallen trees or branches (5), from saplings (2), amongst roots projecting from a road embankment (1) and from a crevice in a large boulder in a dry creek bed (1). All specimens were 20-120cm above the substrate. Other specimens were calling from elevated positions in *Hemholtzia acorifolia* plants, and small *Oraniopsis appendiculata* palms. There appears to be a distinct difference in calling site preference between *C. monticola* and *C. concinnus*. The latter species was not found calling from these palms but usually called from sites no higher than 0.5m, commonly from litter on the forest floor. Calling *C. concinnus* are rather uniformly distributed throughout the forest floor, while *C. monticola* are more conspicuous in areas where the understorey is dominated by *Linospadix* palms.

On the morning of 7.xii.93 an unattended clutch of thirteen unpigmented eggs was found in the axil of a *Linospadix* plant. *C. monticola* had been calling from this area the previous night and the clutch almost certainly belongs to this species because other sympatric species were not calling from these plants. The eggs were in a small clump under accumulated litter in the leaf axil, and were joined by a thin but strong mucilaginous cord as described for *Cophixalus ornatus* (Zweifel, 1985).

COMPARISONS

Morphologically, this species is similar to *C. concinnus*, from which it is distinguished by its mating call. *C. mcdonaldi*, *C. neglectus*, *C. ornatus* and *C. peninsularis* are similar in size to *C. monticola*. Zweifel (1985) has presented a

detailed morphological comparison of these species with *C. concinnus* that will serve to distinguish these species from *C. monticola*. In addition these species, except *C. mcdonaldi*, a geographically isolated species over 300km from the known range of *C. monticola*, have mating calls quite different from the new species. The call of *C. mcdonaldi* remains unknown.

ETYMOLOGY

From the Latin *monticola* = dweller in the mountains, referring to the species' high-mountain habitat.

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